

# Project Prioritization Process STIP Workshop

4-17-2014





## **Outline:**

- **Requirements & Strategic Direction**
- **Preservation & Rehabilitation**
- **Capacity**
- **Safety**

## Utah Code Section 72-1-304

(Enacted by Senate Bill 25, 2005 General Session)

- Directs the Commission, in consultation with the Department and the Metropolitan Planning Organizations in the State, to issue rules that establish a prioritization process for new transportation projects that meet the Department's strategic goals.

## Rule R940-6. Prioritization of New Transportation Capacity Projects

- Written to fulfill the directive given by State Code 72-1-304.

# Administrative Rule

## **Rule R907-68 States,**

### **The Department will use the Strategic Goals to:**

- First seek to preserve & optimize mobility of the current infrastructure.
- Improve the mobility of the existing system through technology like intelligent transportation systems (ITS), as well as using other tools such as access management, transportation demand management, etc...
- Address safety through projects in preservation and mobility, as well as target specific highway locations for safety improvements.
- Add new capacity projects.

**All recommendations to be forwarded to the Transportation Commission for its review/action.**

## The Department's Strategic Goals:



### **PRESERVE INFRASTRUCTURE**

UDOT is preserving Utah's existing transportation infrastructure. The state's multi-billion dollar investment in roads, bridges and other assets must be maintained for future generations.



### **OPTIMIZE MOBILITY**

UDOT works to optimize traffic mobility through a number of measures, including adding capacity, innovative design, managed lanes, signal coordination and the TravelWise program.



### **ZERO FATALITIES**

UDOT remains committed to safety, and the goal to consistently improve safety on Utah's roads can be summed up in two words: Zero Fatalities.



### **STRENGTHEN THE ECONOMY**

This goal recognizes UDOT's role in creating and managing a transportation system that enables economic growth and empowers prosperity.

# Project Selection & Prioritization

## *Remember...*

The Ranking Process is designed to support the **decision-making process**, rather than render a decision.

The process is a means to help the Utah Transportation Commission generally prioritize and rank projects in order of their importance.

**Commission can override the process** as long as it is discussed in a public meeting and a reason for the decision is documented.

# Plan to Program

*Input* - LRP, MPO's, JHC, UDOT, Public, Data

Strengthen Economy

Preserve  
Infrastructure

- Asset Management

Optimize  
Mobility

- Traffic Demand Management
- Access Management
- Capacity Prioritization Process

Zero  
Fatalities

- Safety Management System

Projects

**Statewide Transportation Improvement Program (STIP)**



# Plan to Program

*Input* - LRP, MPO's, JHC, UDOT, Public, Data

Strengthen Economy

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- Asset Management

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- Traffic Demand Management
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- Capacity Prioritization Process

Zero  
Fatalities

- Safety Management System

Projects - **Preservation**, **Rehabilitation**

**Statewide Transportation Improvement Program (STIP)**



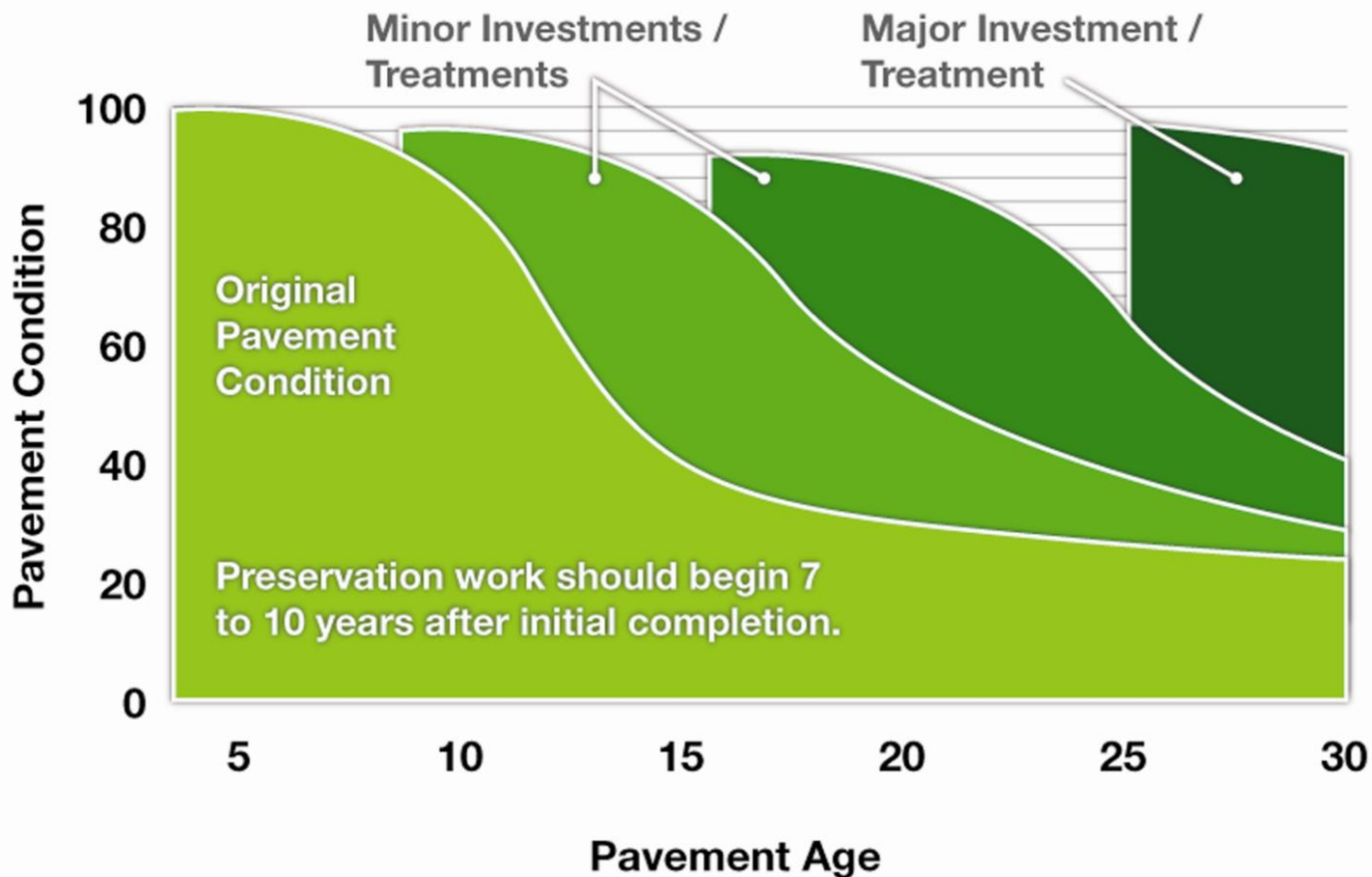
# Preserve Infrastructure



- Decisions are based on accurate data, and sound engineering and economic analysis
- Long-term view of assets
- Improved decision making, supported by policies, performance based goals, performance measures, and appropriate levels of service

# Preserve Infrastructure

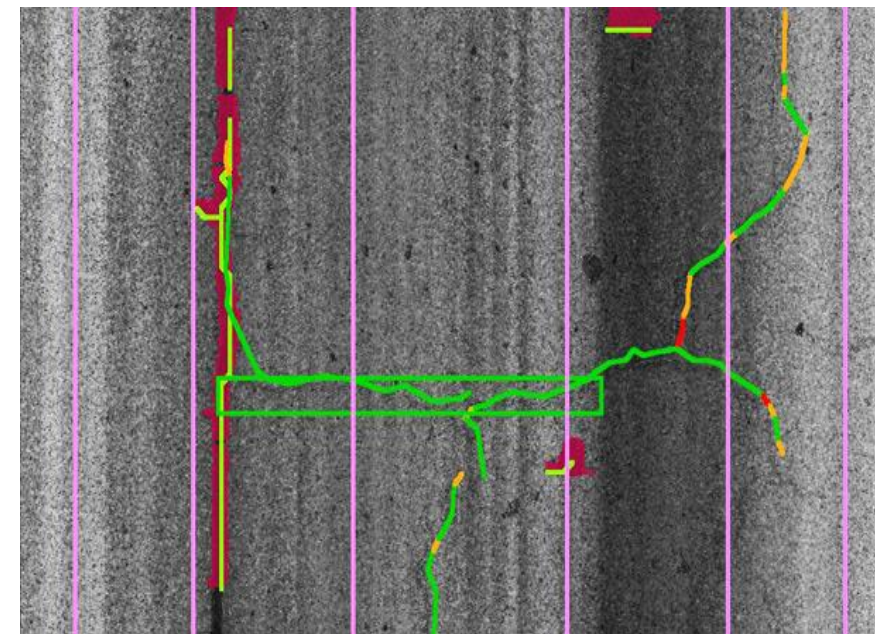
## 30 Year Pavement Performance



# Preserve Infrastructure



## Automated Pavement Data Collection





# Preserve Infrastructure

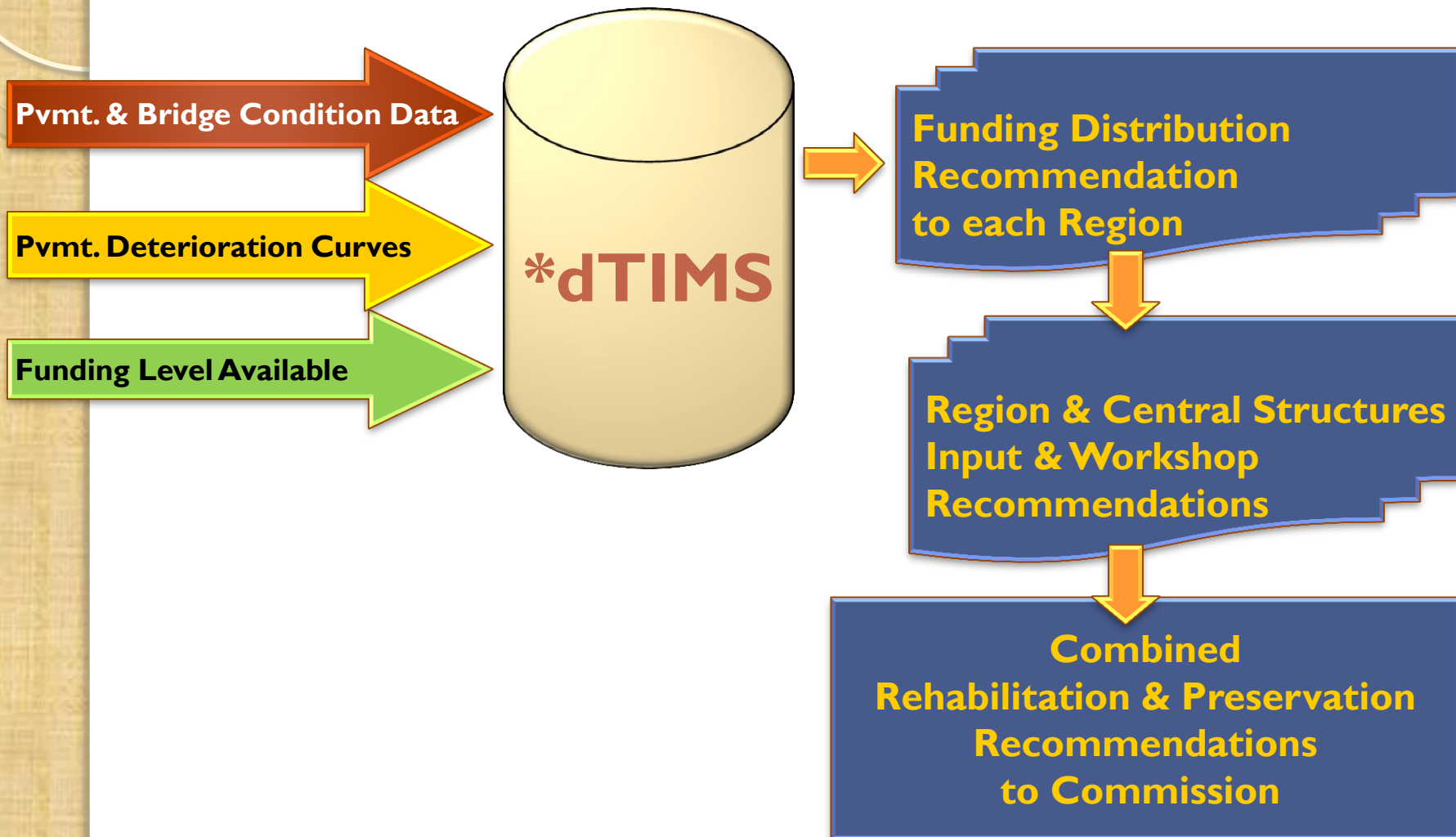


## Bridge Inspections

Measuring and tracking  
condition of 1,750  
bridges statewide



# Preserve Infrastructure



\*dTIMS (Deighton's Total Infrastructure Management System)

# Preserve Infrastructure



## DTIMS Funding Distribution

		NHPP	STP	Total
Percent Dist.	Total With Match	\$ 184,703,494	\$ 42,380,459	\$ 227,083,952
	Capacity/Choke Point	\$ 35,000,000.00	\$ -	\$ 35,000,000
	Major Rehabilitation	\$ 30,000,000.00	\$ -	\$ 30,000,000
	Structures	\$ 12,155,000	\$ 2,057,000	\$ 14,212,000
	Culverts & Signs		\$ 3,000,000.00	\$ 3,000,000
	Sub Total =	\$ 107,548,494	\$ 37,323,458.69	\$ 144,871,952
75%	Purple Book	\$ 80,661,370.20	\$ 27,992,594	\$ 108,653,964
25%	Orange Book	\$ 26,887,123.40	\$ 9,330,865	\$ 36,217,988

DTIMS #'s	NHPP	STP
Region 1	24.90%	32.3%
Region 2	42.90%	17.0%
Region 3	15.10%	25.8%
Region 4	17.10%	24.9%



# Preserve Infrastructure



## DTIMS Funding Distribution

### Orange Book Program - PIN

Region	Composite %	NHPP	STP	Total	<b>2015</b>
R-1	26.8%	\$ 6,694,893.73	\$ 3,013,869.29	\$ 9,708,763.02	
R-2	36.2%	\$ 11,534,575.94	\$ 1,586,246.99	\$ 13,120,822.93	
R-3	17.9%	\$ 4,059,955.63	\$ 2,407,363.09	\$ 6,467,318.72	
R-4	19.1%	\$ 4,597,698.10	\$ 2,323,385.30	\$ 6,921,083.40	
<b>Total</b>	<b>100.0%</b>	<b>\$ 26,887,123.40</b>	<b>\$ 9,330,864.67</b>	<b>\$ 36,217,988.07</b>	

### Purple Book Program - PIN

Region	Composite %	NHPP	STP	Total	<b>2015</b>
R-1	26.8%	\$ 20,084,681.18	\$ 9,041,607.87	\$ 29,126,289.05	
R-2	36.2%	\$ 34,603,727.81	\$ 4,758,740.98	\$ 39,362,468.80	
R-3	17.9%	\$ 12,179,866.90	\$ 7,222,089.26	\$ 19,401,956.16	
R-4	19.1%	\$ 13,793,094.30	\$ 6,970,155.91	\$ 20,763,250.21	
<b>Total</b>	<b>100.0%</b>	<b>\$ 80,661,370.20</b>	<b>\$ 27,992,594.02</b>	<b>\$ 108,653,964.22</b>	

# Plan to Program

*Input* - LRP, MPO's, JHC, UDOT, Public, Data

Strengthen Economy

Preserve  
Infrastructure

- Asset Management

Optimize  
Mobility

- Traffic Demand Management
- Access Management
- Capacity Prioritization Process

Zero  
Fatalities

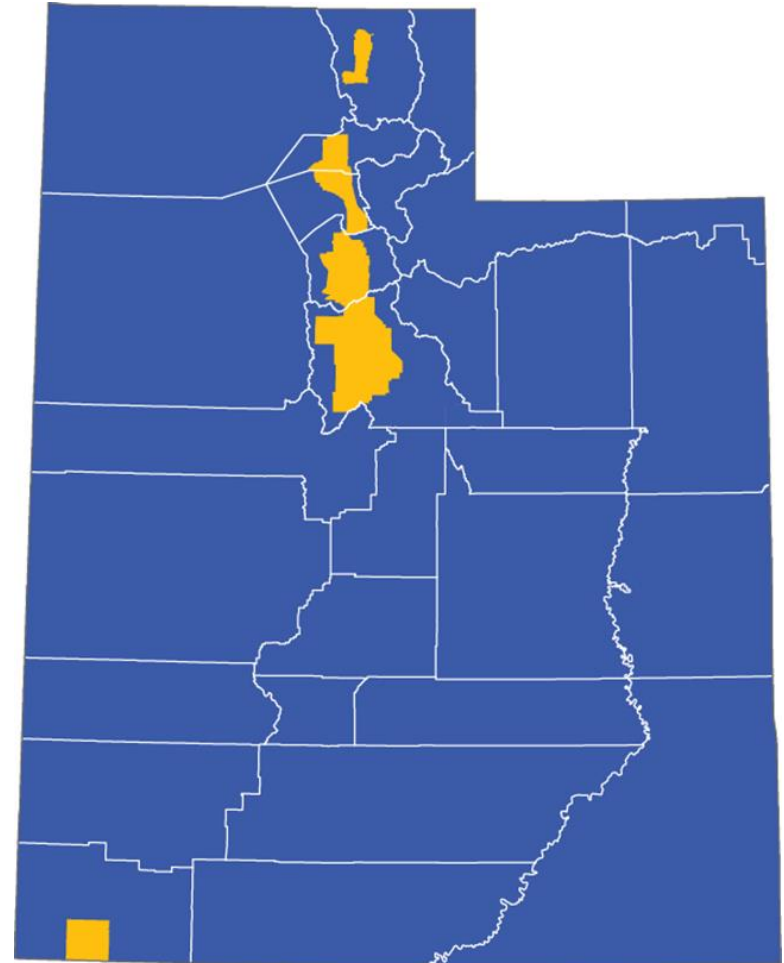
- Safety Management System

Projects - ITS, Access, Capacity

Statewide Transportation Improvement Program (STIP)

# Planning

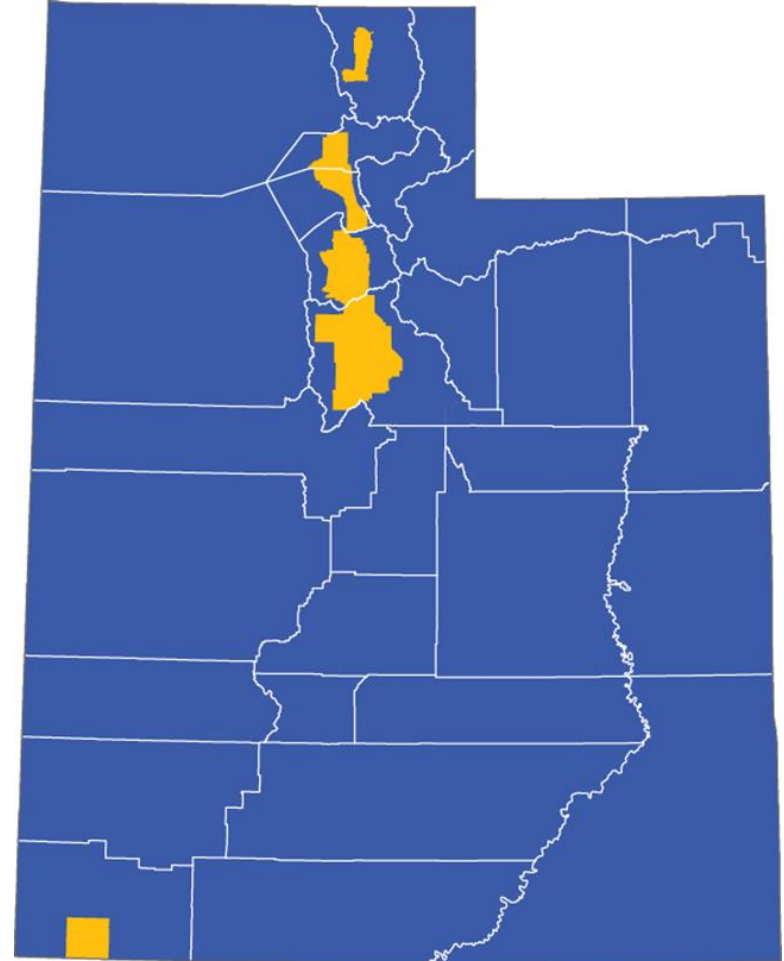
- ❖ Metropolitan Planning Organizations develop Long Range Plans for Urban Areas (RTPs)
- ❖ UDOT is responsible for the remaining Rural Area of the State (LRP)



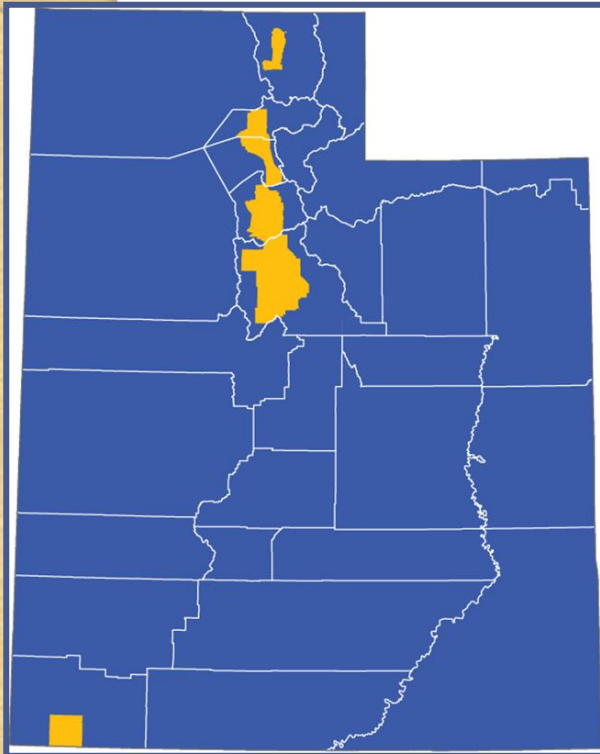


## Planning

- ❖ UDOT and Metropolitan Planning Organizations update the LRP every four years and coordinate several elements:
  - ❖ Schedule of Updates
  - ❖ Plan Phasing
  - ❖ Air Quality Conformity
  - ❖ Financial Assumptions



# Planning



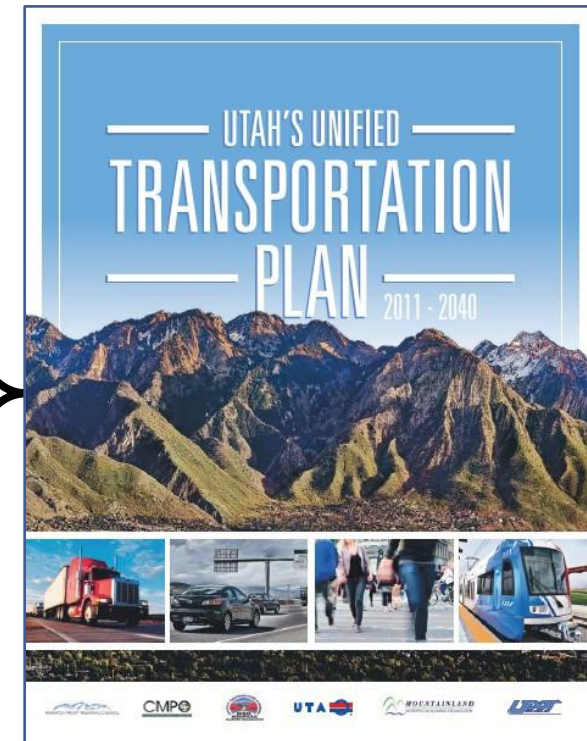
**UDOT Long Range  
Transportation Plan 2011-2040**

**Cache MPO Regional  
Transportation Plan 2011 -2035**

**Dixie MPO Regional  
Transportation Plan 2011-2040**

**MAG Regional Transportation  
Plan 2011-2040**

**WFRC Regional Transportation  
Plan 2011-2040**

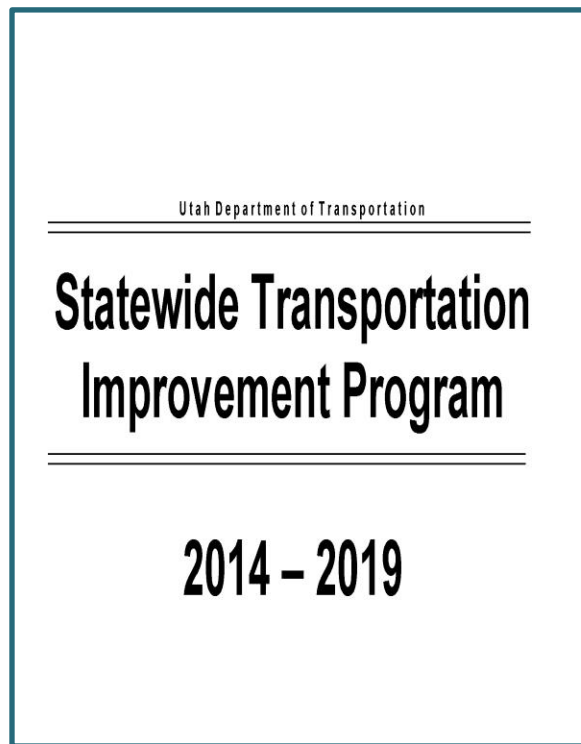
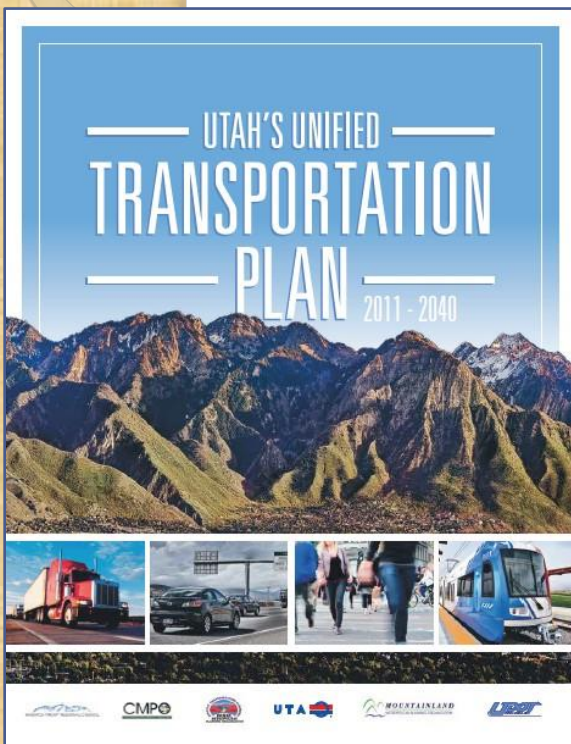


## Utah's Unified Transportation Plan

# Plan to Program

## Capacity Prioritization Processes

1. Widen Existing Facilities
2. New Facilities
3. Upgrade Existing At-Grade Intersection
4. New Interchange on Existing Freeway
5. Upgrade Existing Interchange
6. Passing Lanes





# Plan to Program

*Input* - LRP, MPO's, JHC, UDOT, Public, Data

Strengthen Economy

Preserve  
Infrastructure

- Asset Management

Optimize  
Mobility

- Traffic Demand Management
- Access Management
- Capacity Prioritization Process

Zero  
Fatalities

- Safety Management System

Project Type - **Capacity**

Statewide Transportation Improvement Program (STIP)

# Plan to Program

## Prioritization Processes

1. **Widen Existing Facilities**
2. New Facilities
3. Upgrade Existing At-Grade Intersection
4. New Interchange on Existing Freeway
5. Upgrade Existing Interchange
6. Passing Lanes

# Optimize Mobility

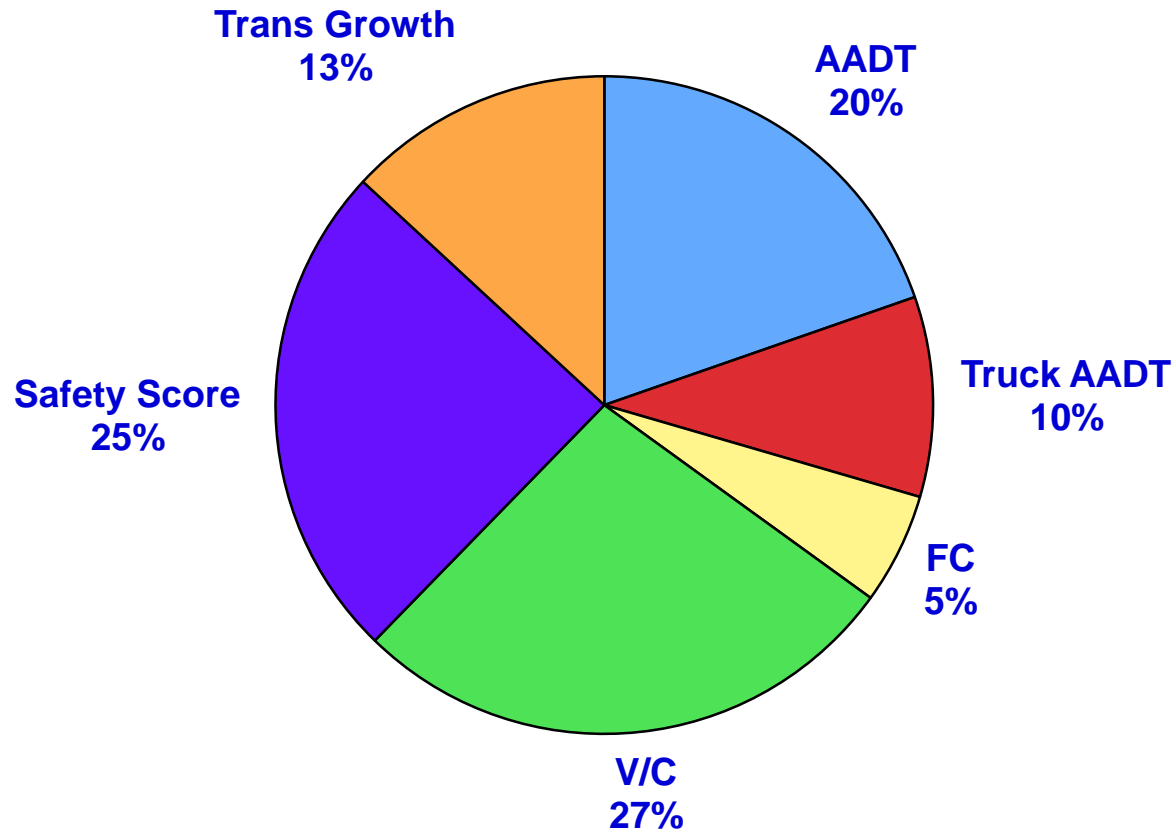
## Capacity – #1 Widen Existing Facility

Objective	Factor	Max. Score
<b>Transportation Efficiency</b>	Total AADT- Volume of Traffic on a Daily Average	20
	Truck AADT	10
	V/C – Measure of a Highway's Congestion	25
	Functional Class – Measure of Road Importance	5
	Transportation Growth	15
<b>Safety</b>	Safety Score – Combination of Measures	25
	Total Possible Points	100

# Optimize Mobility

Capacity – #1 Widen Existing Facility

## Ranking Factors – Percent Weight





# Optimize Mobility

## Capacity - #1 Widen Existing Facility

### Existing AADT Score

Min AADT	Score
0	2
11,000	4
33,000	8
44,000	10
55,000	12
66,000	14
77,000	16
88,000	18
99,000	20

### Existing Truck AADT Score

Min Truck AADT	Score
0	1
2,001	2
4,001	4
5,001	5
6,001	6
7,001	7
8,001	8
9,001	9
10,001	10

### V/C Score

Min V/C	Score
0.00	0
0.60	1.25
0.65	2.5
0.75	5
0.80	6.25
0.85	7.5
0.90	10
0.95	12.5
1.00	15
1.05	17.5
1.10	20
1.15	22.5
1.20	25

# Optimize Mobility

## Capacity - #1 Widen Existing Facility

### Functional Class Score

FC	Score	Note
1	5	Rural Interstate
2	3	Rural Other Principal Arterial
6	2	Rural Minor Arterial
7	0	Rural Major Collector
8	0	Rural Minor Collector
9	0	Rural Local
11	5	Urban Interstate
		Urban Other Freeway and
12	4	Expressway
14	4	Urban Other Principal Arterial
16	2	Urban Minor Arterial
17	1	Urban Collector
19	0	Urban Local

### Transportation Growth Score

Min Annual Growth	Score
0.0%	3
1.0%	6
2.0%	9
3.0%	12
4.0%	15

### Safety Score

Safety Index	Score
0.00	0.0
1.00	2.5
2.00	5.0
3.00	7.5
4.00	10.0
5.00	12.5
6.00	15.0
7.00	17.5
8.00	20.0
9.00	22.5
10.00	25.0

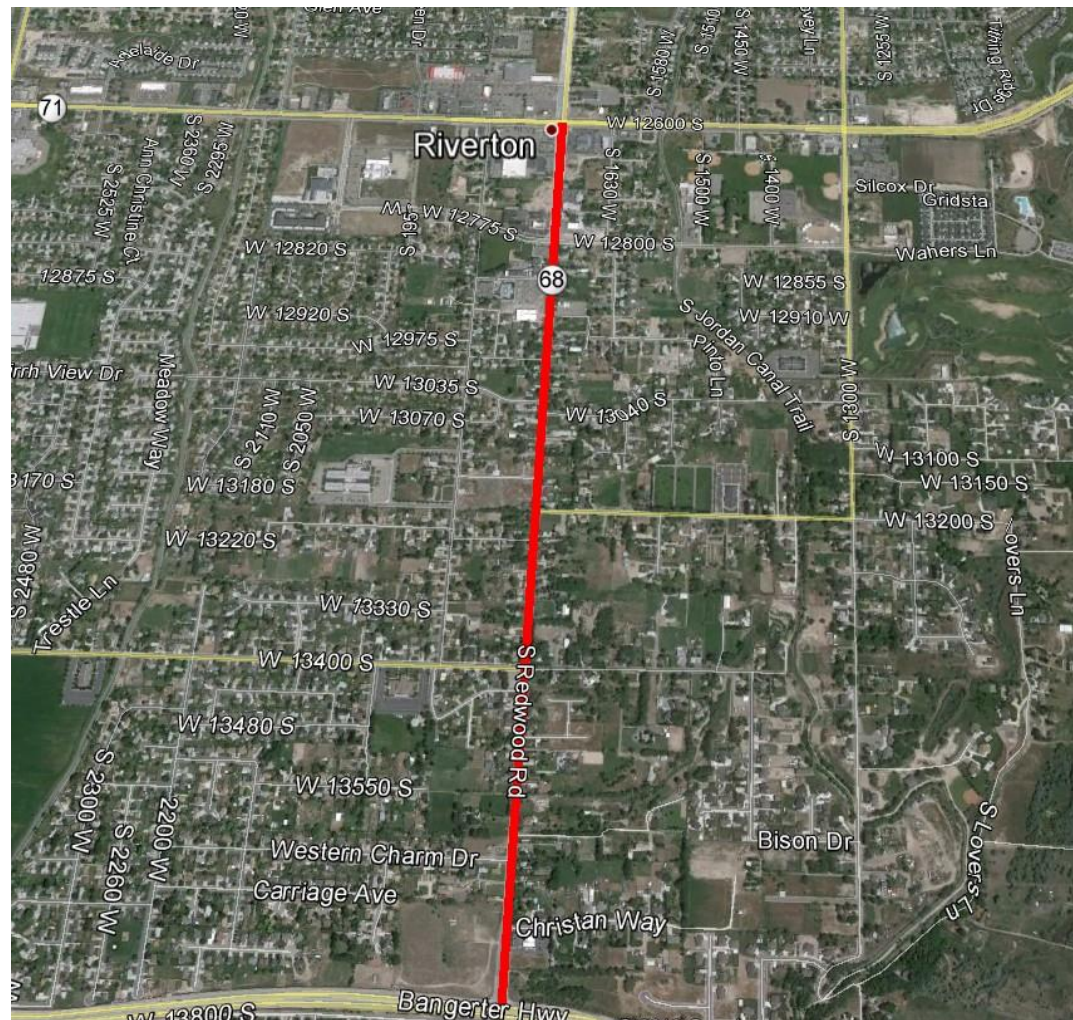
# Optimize Mobility

## Capacity – #1 Widen Existing Facility

- The Safety Index is a value ranging from: 1 (very good) to 10 (very poor), which represents the degree of risk to the driver, in terms of both crash rate and severity.
- Input/factors include number of crashes, number of high severity crashes, AADT and functional class.
- The crash rate, (crashes/MVMT) and severity (#/per mile), are weighted 1 through 3 for each mile section, by functional classification, giving a crash rate score and a severity score.
- $\text{Safety Index (SI)} = \text{Crash Rate Score} + 3(\text{Severity Score}) - 2$   
(SI Range = 1 to 10)

# Optimize Mobility

Capacity – #1 Widen Existing Facility –  
Example: Redwood Road; Bangerter Hwy To 12600 South





# Optimize Mobility

Capacity – #1 Widen Existing Facility

Example: Redwood Road; Bangerter Hwy To 12600 South

Project	2011 AADT	Truck AADT	FC	V/C	Safety Score	Ave Trans. Growth	Total	Rank
Redwood Road; Bangerter Hwy To 12600 South	21,597	1,300	14	1.2	8.5	3.8%		
Score	4	1	4	22.5	21.25	12	65	#7

# Plan to Program

## Prioritization Processes

1. Widen Existing Facilities
2. New Facilities
3. Upgrade Existing At-Grade Intersection
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5. Upgrade Existing Interchange
6. Passing Lanes

# Optimize Mobility



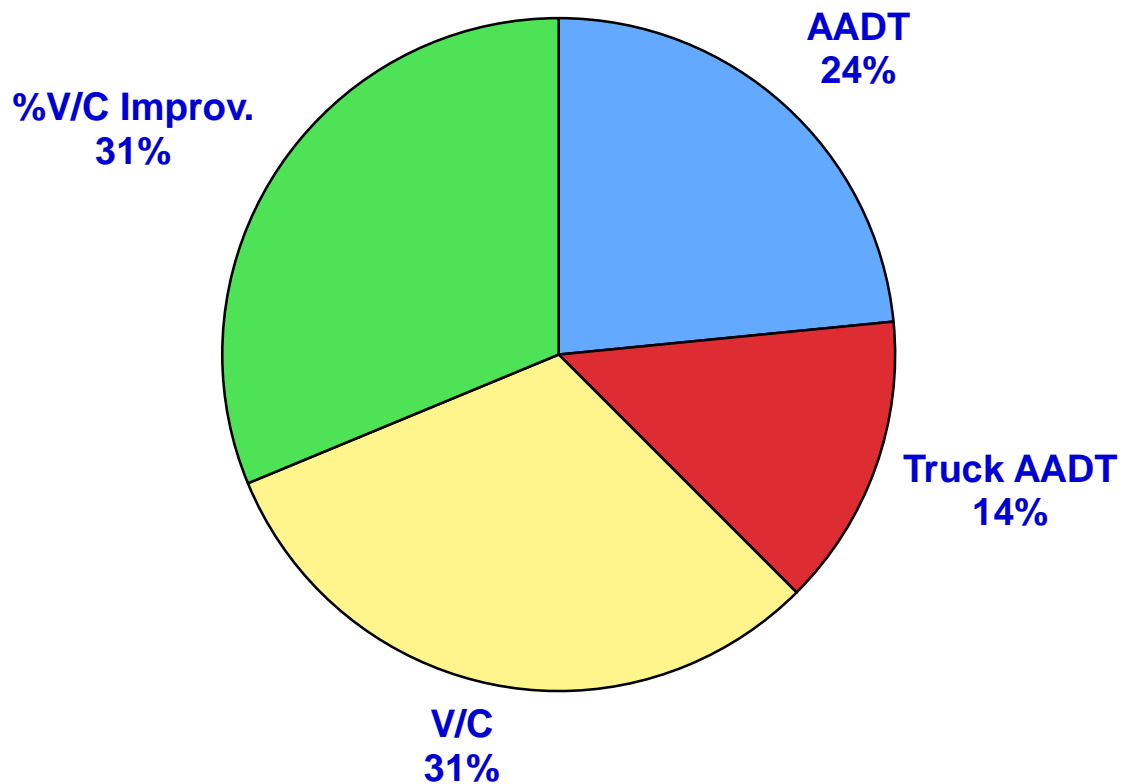
## Capacity - #2 New Facility

Objective	Factor	Max. Score
<b>Transportation Efficiency</b>	Projected AADT on New Facilities in 2040	25
	Projected Truck AADT on New Facilities in 2040	15
	V/C on Existing System if Corridor is not Built	30
	% V/C Improvement on System if Corridor is Built	30
	Total Possible Points	100

# Optimize Mobility

Capacity – #2 New Facility

## Ranking Factors – Percent Weight





# Optimize Mobility

## Capacity - #2 New Facility

### Future AADT Score

Min AADT	Score
0	2.5
16,000	5
24,000	7.5
32,000	10
48,000	15
56,000	17.5
64,000	20
72,000	22.5
80,000	25

### Future Truck AADT Score

Min Truck AADT	Score
0	1.5
1,600	3
2,400	4.5
3,200	6
4,800	9
5,600	10.5
6,400	12
7,200	13.5
8,000	15

### No Build V/C Score

Min V/C	Score
0.00	0.0
0.60	1.5
0.65	3.0
0.70	4.5
0.75	6.0
0.80	7.5
0.85	9.0
0.90	12.0
0.95	15.0
1.00	18.0
1.15	27.0
1.20	30.0

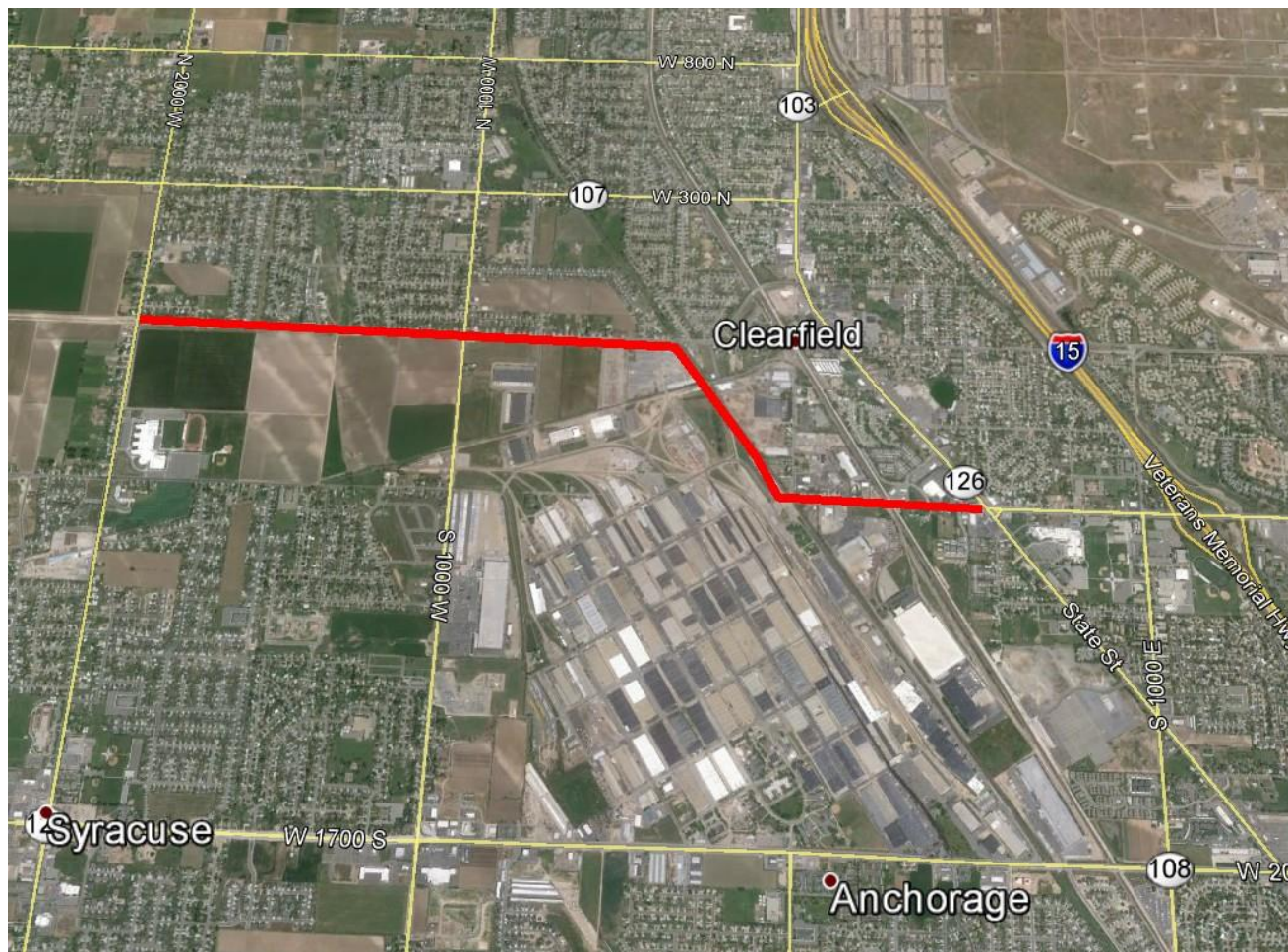
### Improve V/C Score

Percent Improvement	Score
0.0%	0
5.0%	3
10.0%	6
15.0%	12
20.0%	21
25.0%	30

# Optimize Mobility

Capacity – #2 New Facility

Example: SR-193; Extension, 2000 West to State Street



# Optimize Mobility

Capacity – #2 New Facility

Example: SR-193; Extension, 2000 West to State Street

Project	2040 AADT	2040 Truck AADT	NO Build V/C	% System Improvement, with new facility	Total	Rank
SR-193; Extension, 2000 West to State Street	21,644	3,161	.99	45.5%		
Score	5	4.5	15	30	55	#8

# Plan to Program

## Prioritization Processes

1. Widen Existing Facilities
2. New Facilities
3. Upgrade Existing At-Grade Intersection
4. New Interchange on Existing Freeway
5. Upgrade Existing Interchange
6. Passing Lanes



# Optimize Mobility

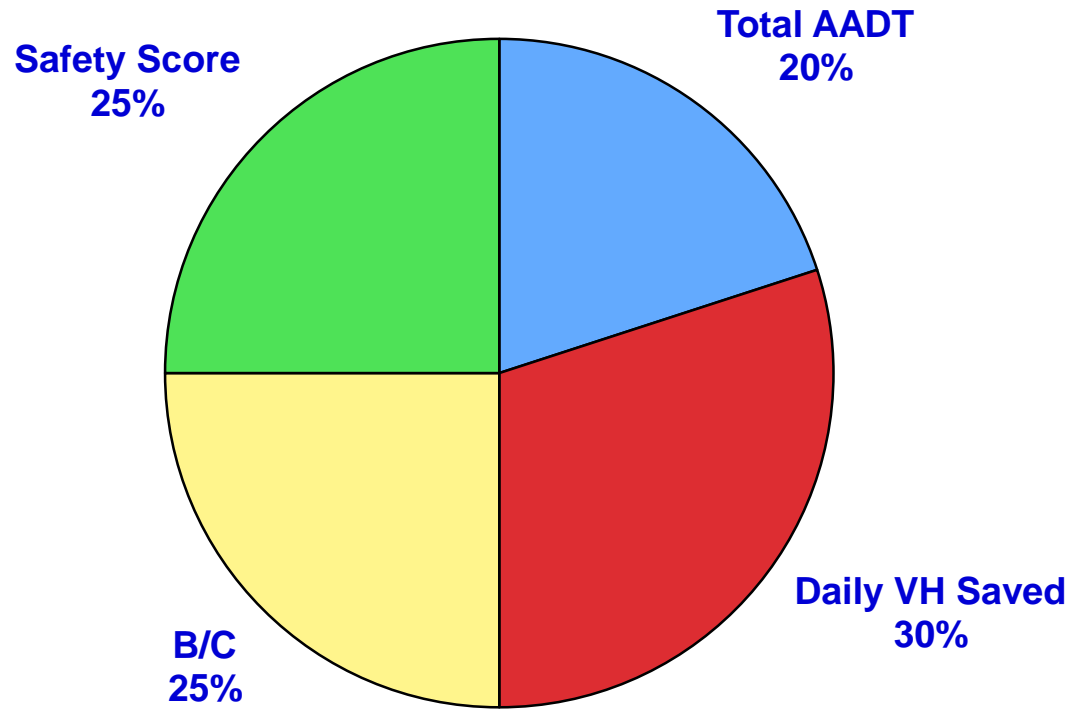
## Capacity – #3 Upgrade Existing At-grade Intersection

Objective	Factor	Max Score
Transportation Efficiency	Total AADT- Volume of traffic on a daily average for both mainline and arterial	20
	Daily Vehicle Hours Saved - Estimate based on travel time savings per vehicle	30
	Benefit Cost Ratio - Total user cost benefit from delay savings divided by the net cost of the interchange after local participation	25
Safety	Safety Score – Combination of measures	25
	Total Possible Points	100

# Optimize Mobility

Capacity – #3 Upgrade Existing At-Grade Intersection

Ranking Factors – Percent Weight



# Optimize Mobility

## Capacity - #3 Upgrade Existing At-Grade Intersection

### Future Entering Traffic Score

Min AADT	Score
0	0
40,000	4
50,000	8
60,000	12
70,000	16
80,000	20

### Vehicle Hours Saved Score

Min Hours Saved	Score
0	0
300	6
400	12
500	18
600	24
700	30

### Safety Score

Safety Index	Score
0.00	0.0
1.00	2.5
2.00	5.0
3.00	7.5
4.00	10.0
5.00	12.5
6.00	15.0
7.00	17.5
8.00	20.0
9.00	22.5
10.00	25.0

### Benefit-Cost Score

B-C Ratio	Score
0.0	0
2.0	5
4.0	10
6.0	15
8.0	20
10.0	25

# Optimize Mobility

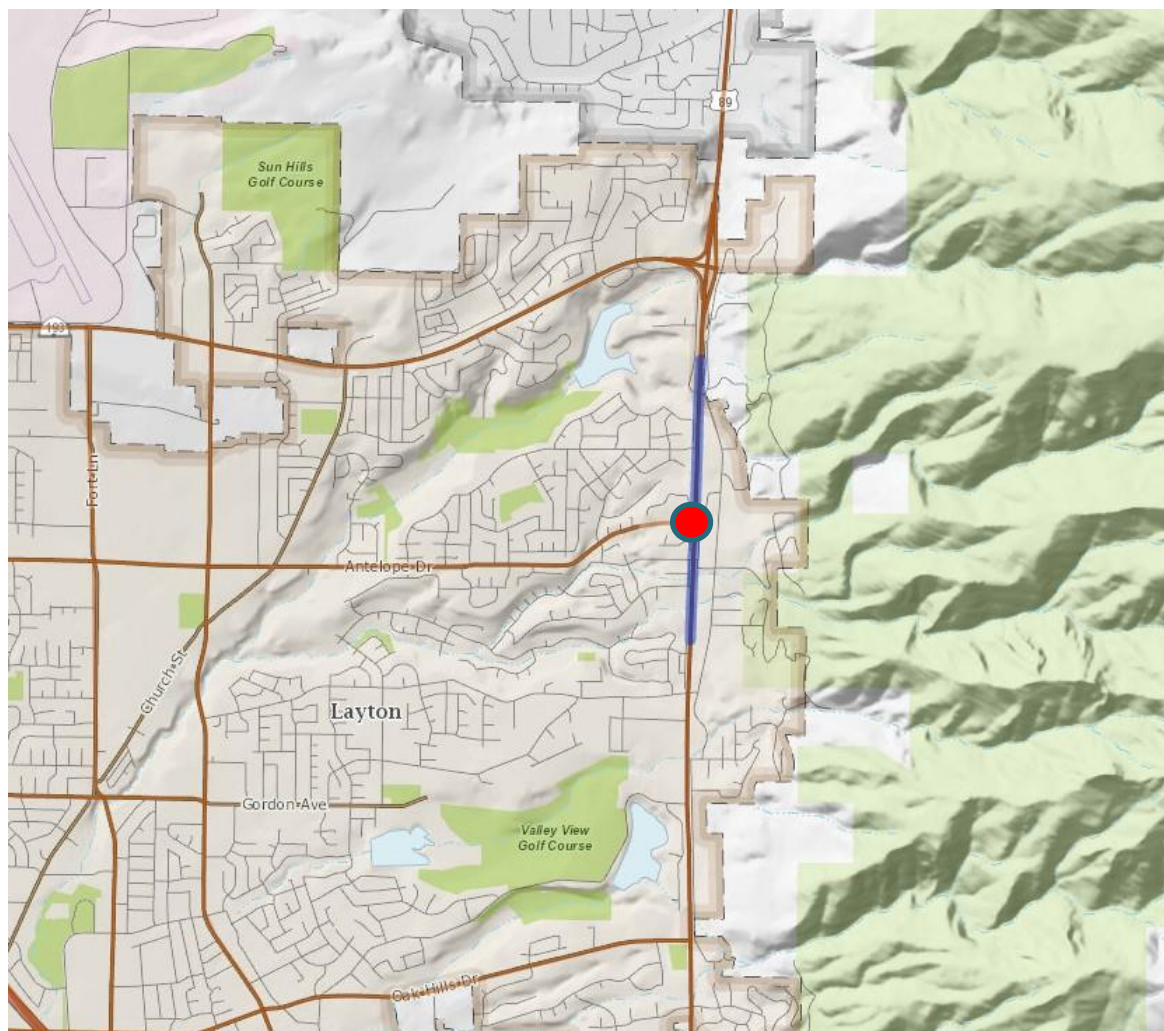
Capacity – #3 Upgrade Existing At-grade Intersection  
Example: US-89; Antelope Dr. Intersection Improvements

Project	2040 AAD T	B/C	Daily Vehicle Hours Saved	Safety Score	Total	Rank
US-89; Antelope Dr. Intersection Improvements	86,000	2.2	717	5.5		
Score	20	5	30	13.8	69	#5



# Optimize Mobility

Capacity – #3 Upgrade Existing At-grade Intersection  
Example: US-89; Antelope Dr. Intersection Improvements



# Plan to Program

## Prioritization Processes

1. Widen Existing Facilities
2. New Facilities
3. Upgrade Existing At-Grade Intersection
4. New Interchange on Existing Freeway
5. Upgrade Existing Interchange
6. Passing Lanes

# Optimize Mobility

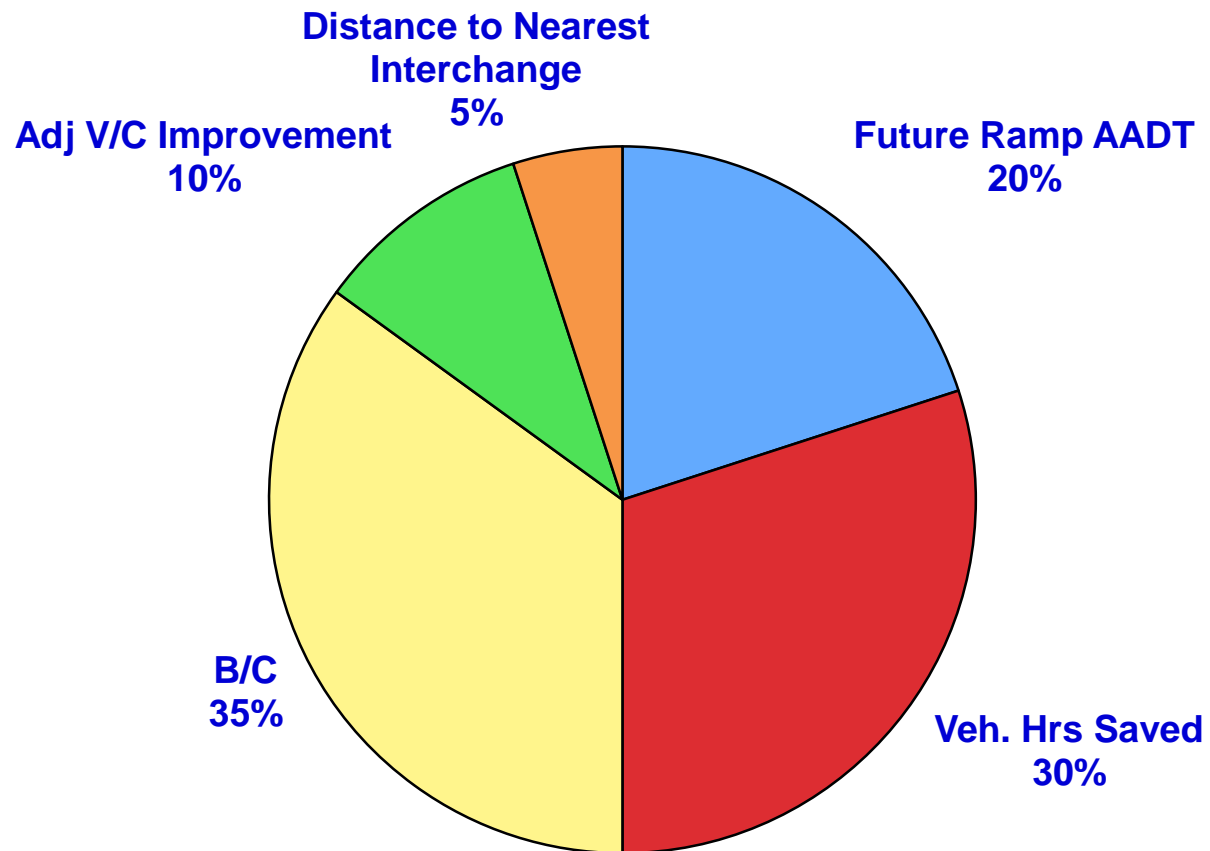
## Capacity – #4 New Interchange On Existing Freeway

Objective	Factor	Max Score
Transportation Efficiency	Total Ramp Daily Traffic- Total Estimated AADT for all 4 Ramps	20
	Daily Vehicle Hours Saved – Estimate based on travel time savings using existing transportation system	30
	Benefit Cost Ratio – Total user cost benefit from delay savings divided by the net cost of the interchange after local participation	35
	Adjacent Interchange V/C – Measures the effect on adjacent interchange	10
	Distance to Adjacent Interchanges – Addresses spacing and accessibility issues	5
	Total Possible Points	100

# Optimize Mobility

Capacity – #4 New Interchange On Existing Freeway

## Ranking Factors – Percent Weight





# Optimize Mobility

## Capacity – #4 New Interchange On Existing Freeway

### Future Ramp Traffic Score

Min AADT	Score
0	0
10,000	4
15,000	8
20,000	12
25,000	16
30,000	20

### Vehicle Hours Saved Score

Min Hours Saved	Score
0	0
300	6
400	12
500	18
600	24
700	30

### Benefit-Cost Score

B-C Ratio	Score
0.0	0
2.0	7
4.0	14
6.0	21
8.0	28
10.0	35

### Adjacent Interchange Future V/C Score

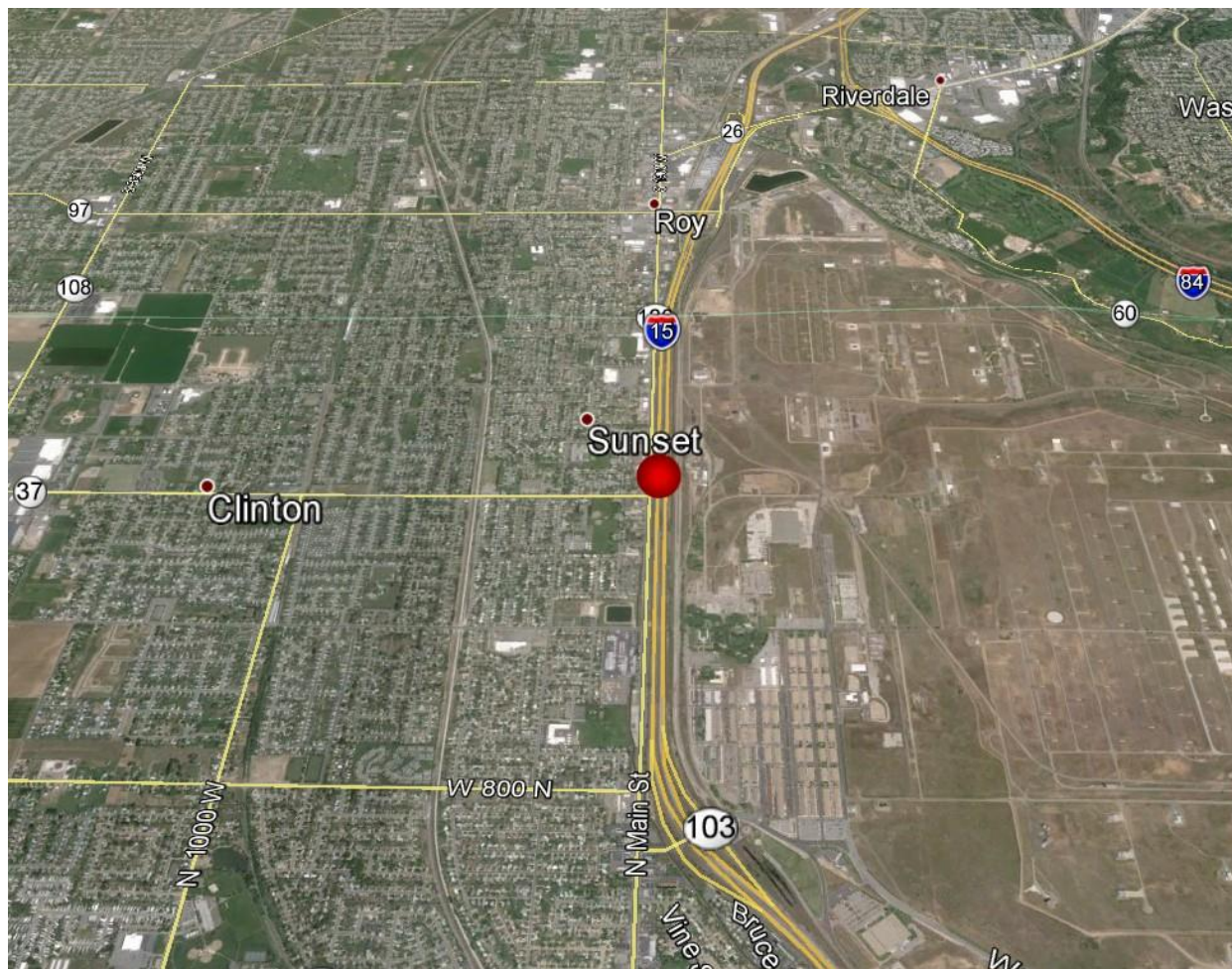
Min V/C	Score
-5.00	0
0.05	2
0.10	4
0.15	6
0.20	8
0.25	10

### Distance to Adjacent Interchange Score

Distance	Score
0.0	0
1.0	1
1.5	2.5
2.0	5

# Optimize Mobility

Capacity – #4 New Interchange On Existing Freeway  
Example: I-15; SR-37 Interchange and 1800 N. Widening



# Optimize Mobility

Capacity – #4 New Interchange On Existing Freeway  
Example: I-15; SR-37 Interchange and 1800 N. Widening

Project	2040 Ramp AADT	B/C	Daily Vehicle Hours Saved	Adjacent Interchange Future V/C	Average Distance To Adjacent Interchange	Total	Rank
I-15 Interchange at 1800 North	41,000	2.1	683	0.33	1.10	62	#1
Score	20	7	24	10	1		

# Plan to Program

## Prioritization Processes

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2. New Facilities
3. Upgrade Existing At-Grade Intersection
4. New Interchange on Existing Freeway
5. Upgrade Existing Interchange
6. Passing Lanes



# Optimize Mobility

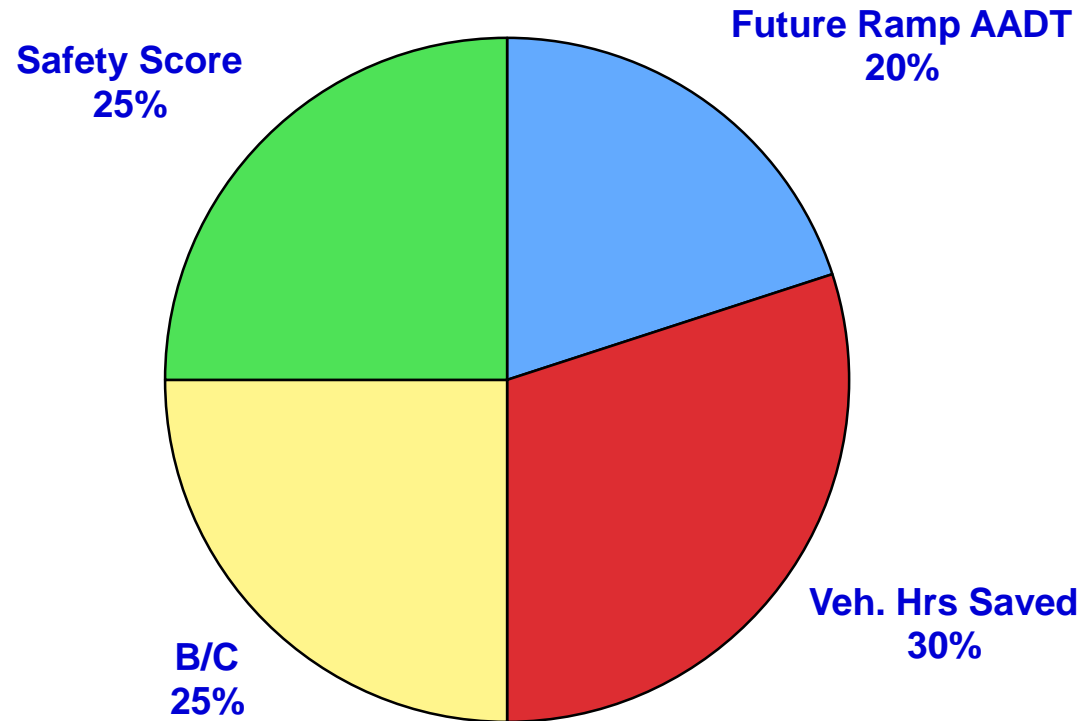
## Capacity – #5 Upgrade Existing Interchange

Objective	Factor	Max Score
Transportation Efficiency	Future Ramp Daily Traffic- Total Estimated AADT for all 4 Ramps	20
	Daily Vehicle Hours Saved – Estimate based on travel time savings using existing transportation system	30
	Benefit Cost Ratio – Total user cost benefit from delay savings divided by the net cost of the interchange after local participation	25
Safety	Safety Score – Combination of Measures	25
	Total Possible Points	100

# Optimize Mobility

## Capacity – #5 Upgrade Existing Interchange

### Ranking Factors – Percent Weight



# Optimize Mobility

## Capacity – #5 Upgrade Existing Interchange

### Future Ramp Traffic Score

Min AADT	Score
0	0
10,000	4
20,000	8
30,000	12
40,000	16
50,000	20

### Safety Score

Safety Index	Score
0.00	0.0
1.00	2.5
2.00	5.0
3.00	7.5
4.00	10.0
5.00	12.5
6.00	15.0
7.00	17.5
8.00	20.0
9.00	22.5
10.00	25.0

### Vehicle Hours Saved Score

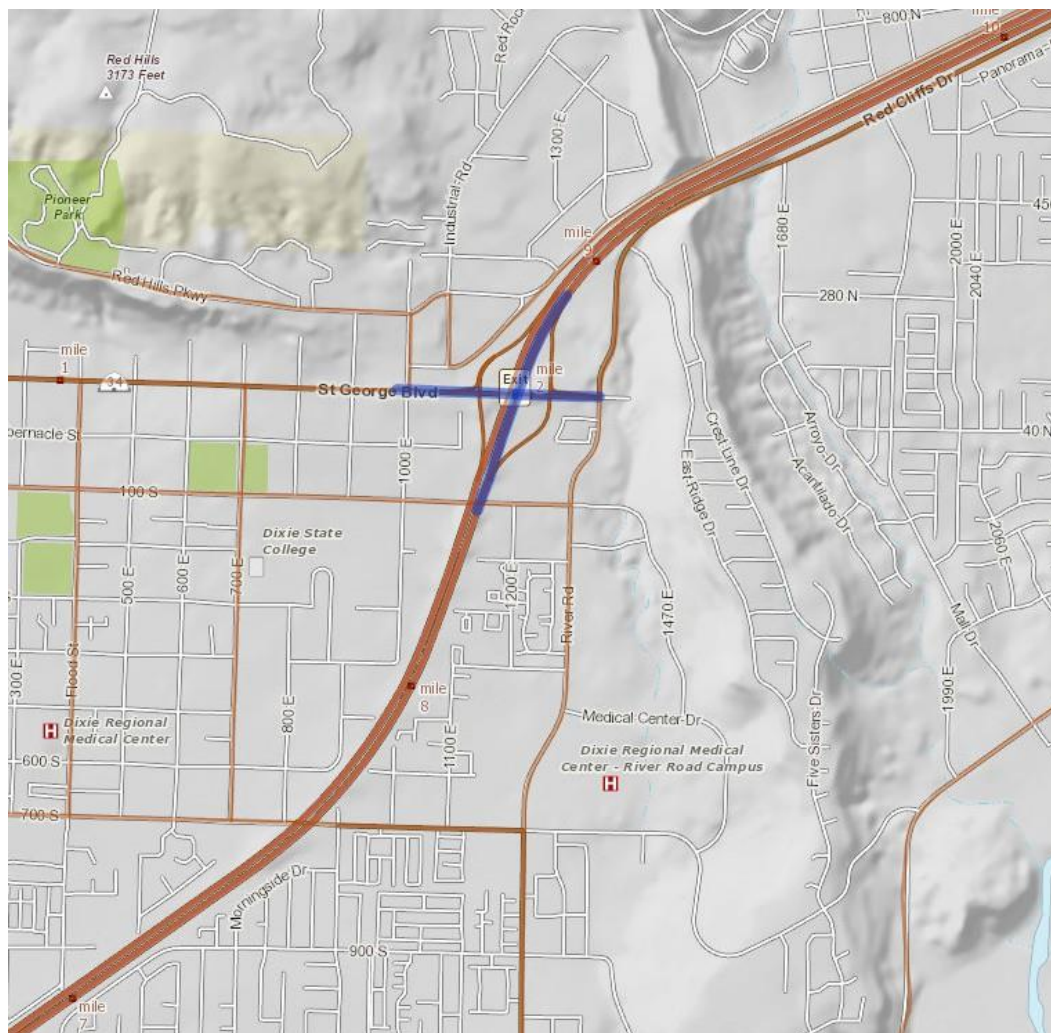
Min Hours Saved	Score
0	0
100	6
200	12
300	18
400	24
500	30

### Benefit-Cost Score

B-C Ratio	Score
0.0	0
1.0	5
2.0	10
3.0	15
4.0	20
6.0	25

# Optimize Mobility

Capacity – #5 Upgrade Existing Interchange  
Example: I-15; MP 8 Interchange Reconfiguration (DDI)





# Optimize Mobility

Capacity – #5 Upgrade Existing Interchange

Example: I-15; MP 8 Interchange Reconfiguration (DDI)

Project	2040 Ramp AADT	B/C	Daily Vehicle Hours Saved	Safety Index	Total	Rank
I-15 Interchange at 1800 North	138,000	13.5	1150	4.0	85	#5
Score	20	25	30	10		

# Plan to Program

## Prioritization Processes

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# Optimize Mobility

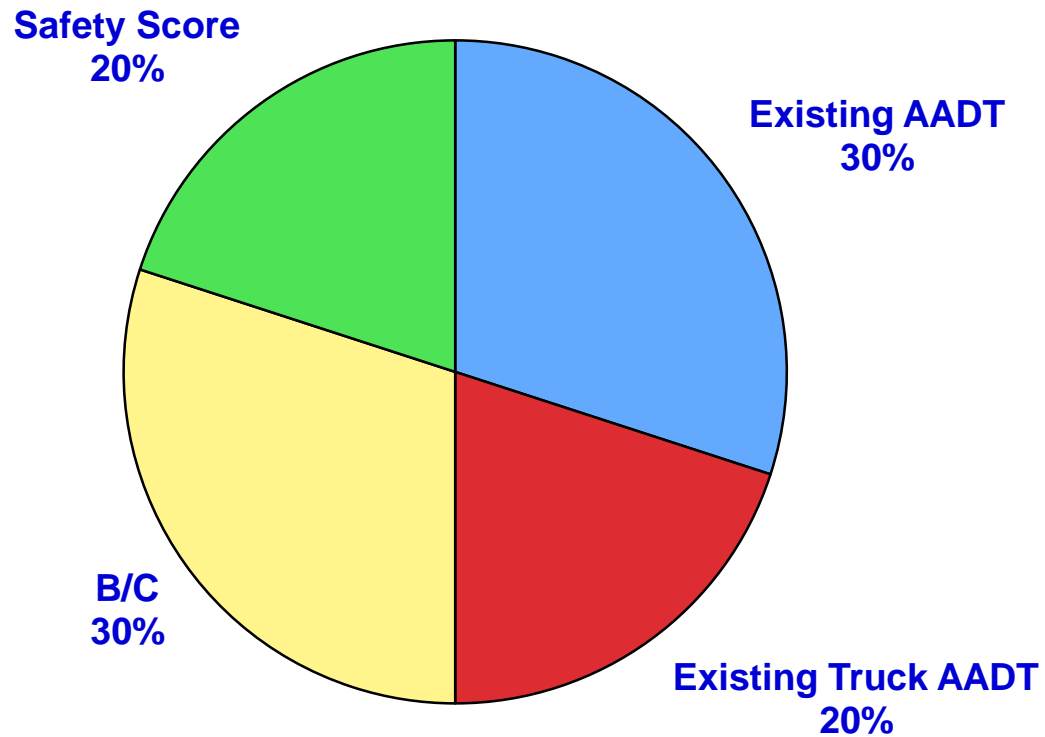
## Capacity – #6 Passing Lanes

Objective	Factor	Max Score
Transportation Efficiency	Existing AADT	30
	Existing Truck AADT	20
	Primary Freight Corridor	20
Safety	Safety Index – Combination of Measures	30
	Total Possible Points	100

# Optimize Mobility

## Capacity – #6 Passing Lanes

### Ranking Factors – Percent Weight





# Optimize Mobility

## Capacity – #6 Passing Lanes

### Existing AADT Score

Min AADT	Score
0	3
2,501	6
5,001	9
7,501	12
10,001	15
12,501	18
15,001	21
17,501	24
20,001	27
22,501	30

### Existing Truck AADT Score

Min Truck AADT	Score
0	2
501	4
1,001	6
1,501	8
2,001	10
3,001	12
4,001	14
5,001	16
6,001	18
7,001	20

### Safety Score

Safety Index	Score
0.00	0.0
1.00	3.0
2.00	6.0
3.00	9.0
4.00	12.0
5.00	15.0
6.00	18.0
7.00	21.0
8.00	24.0
9.00	27.0
10.00	30.0

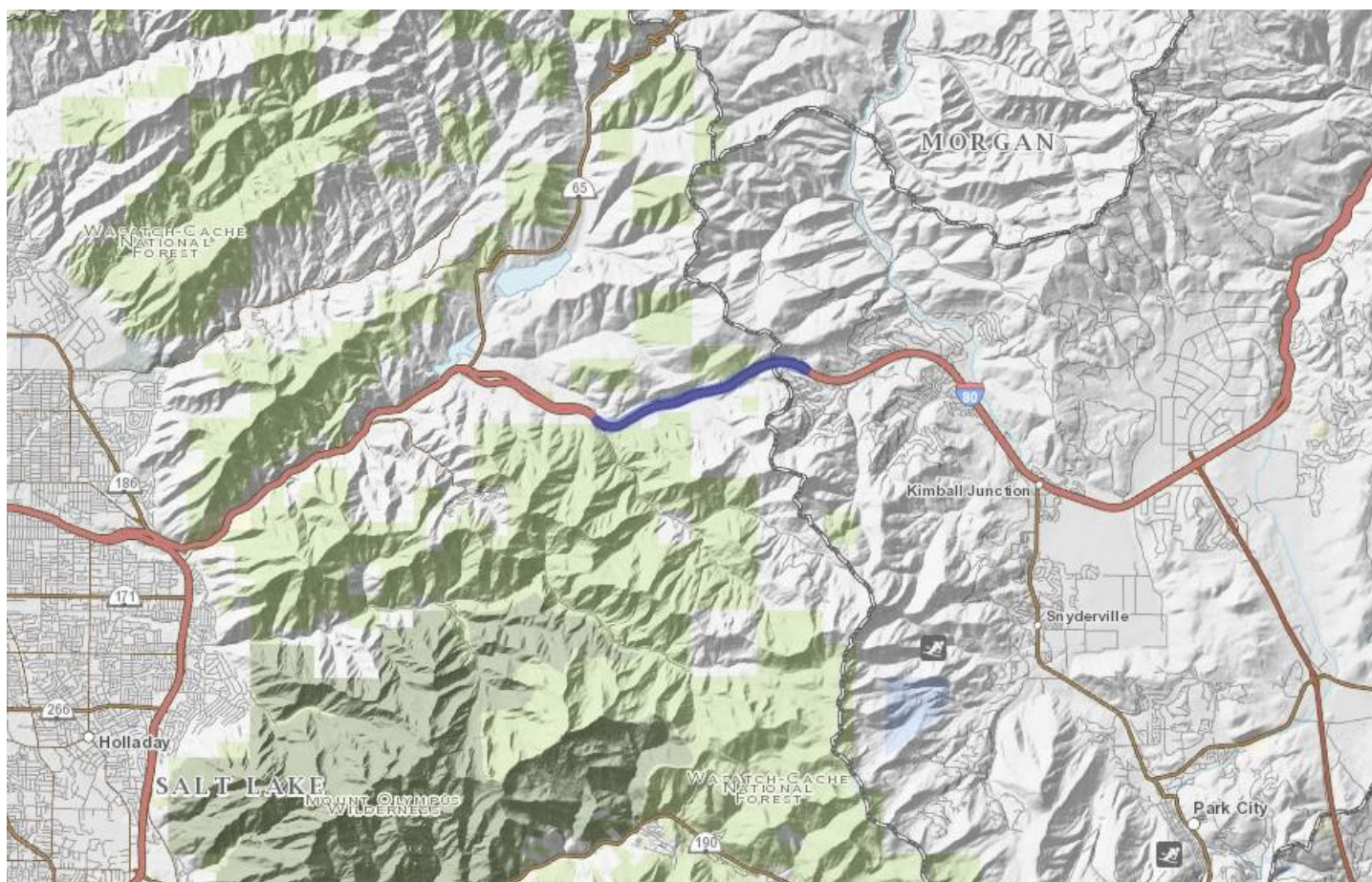
### Primary Freight Corridor Score

Classification	Score
Energy Route	15
Interstate	5
Major Route	20
No	0

# Optimize Mobility

Capacity – #6 Passing Lanes

Example: I-80; MP 136 to 143, Lambs Canyon to Kimball Junction



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Capacity – #6 Passing Lanes

Example: I-80; MP 136 to 143, Lambs Canyon to Kimball Junction

Project	Existing AADT	Existing Truck AADT	Primary Freight Corridor	Safety Index	Total	Rank
I-80; MP 136 to 143, Lambs Canyon to Kimball Junction	45,490	12,320	Interstate	7.0		
Score	30	20	5	21	76	#2

# Plan to Program

*Input* - LRP, MPO's, JHC, UDOT, Public, Data

Strengthen Economy

Preserve  
Infrastructure

- Asset Management

Optimize  
Mobility

- Traffic Demand Management
- Access Management
- Capacity Prioritization Process

Zero  
Fatalities

- Safety Management System

Projects - **Safety Improvements**

**Statewide Transportation Improvement Program (STIP)**



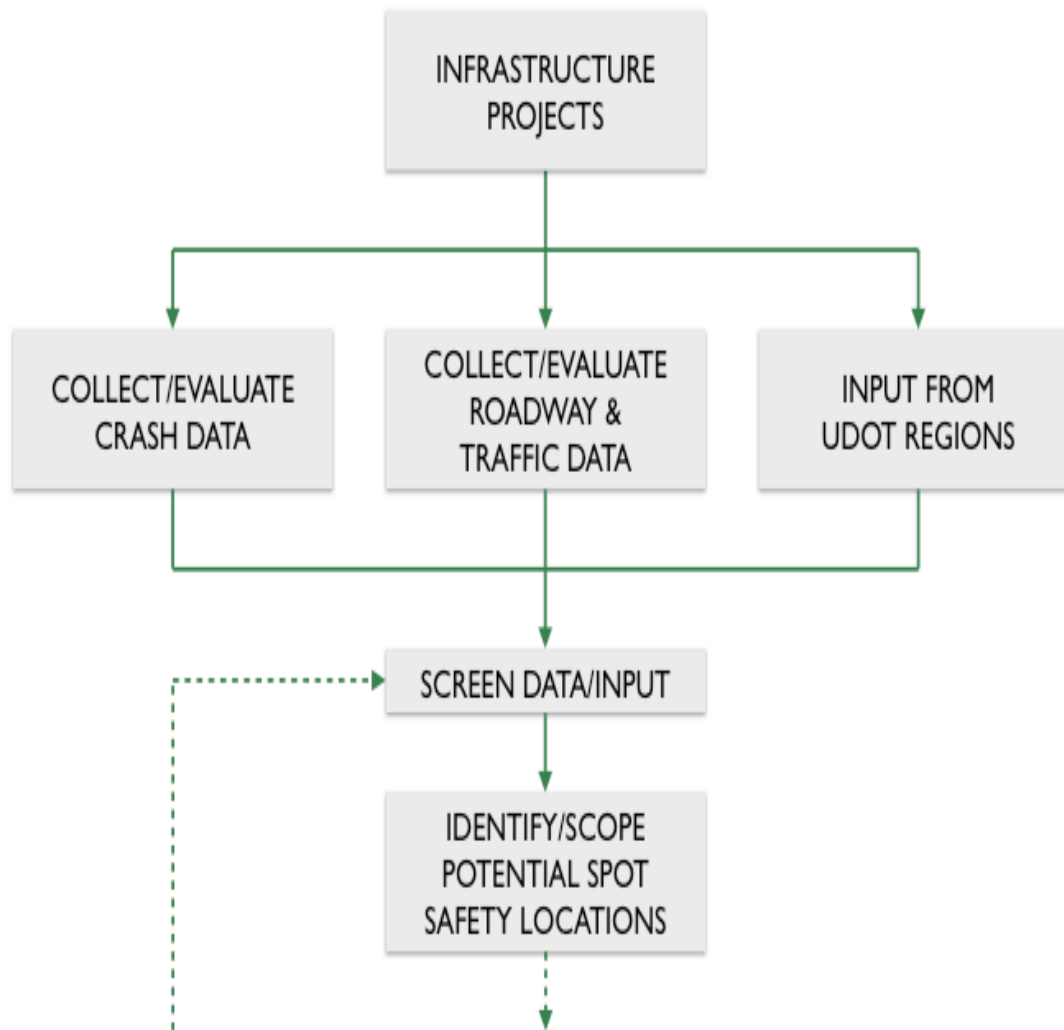
# Improve Safety

- Highway Safety Improvement Program
- Safe Routes to Schools
- Railroad Crossing

- State Spot Safety Improvement Program
- State Barrier
- State Lighting
- State Signals

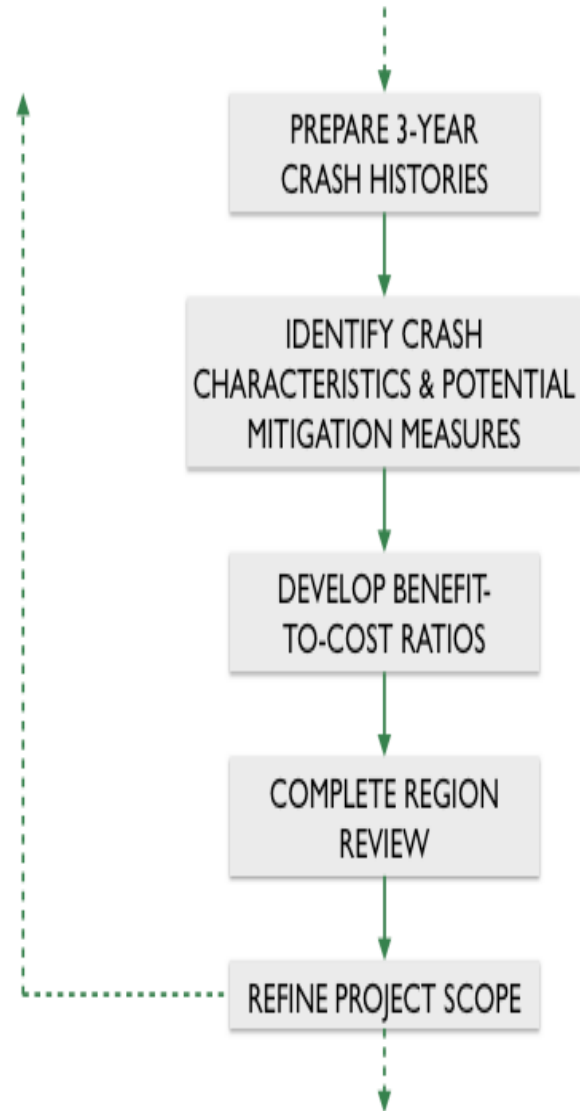
# Improve Safety

## Planning Stage



# Improve Safety

## Analysis Stage



# Improve Safety



## Project Prioritization Factors

- Greatest Benefit to Reduce Fatal and Serious Injury Crashes
- Benefit-To-Cost Ratio
- Timeline to Completion
- Coordination with Other Projects



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